

REMARKS

Per the telephone conversation with the Examiner in February 2003, applicant's attorneys respectfully request the Examiner to call upon safe receipt of this Amendment to schedule a telephone interview in advance of the Examiner's reexamination and reconsideration of the present application in view of the present Amendment. ✓

Claims 13 and 14 are pending. Claims 6-8 have been canceled without prejudice. Independent claim 13 has been amended. New independent claim 14 has been added. No new matter has been introduced. Reexamination and reconsideration of the application are respectfully requested.

In the July 10, 2002 Final Office Action, the Examiner rejected claims 6-8 and 13. The Examiner rejected claims 7, 8, and 13 under 35 U.S.C. § 112, first paragraph, as containing subject matter not described in the specification. The Examiner rejected claims 6-8 and 13 under 35 U.S.C. § 112, second paragraph, as failing to set forth the subject matter that applicant regards as the invention. The Examiner rejected claims 6 and 13 under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,018,507 to Takeda et al. (the Takeda reference). The Examiner rejected claims 6-8 and 13 under 35 U.S.C. § 103(a) as being obvious over U.S. Patent No. 6,011,762 to Watanabe et al. (the Watanabe reference), considered with the Takeda reference. These rejections are respectfully traversed.

The present invention relates to a system and method of recording information on an optical disk utilizing a mark-length recording scheme. Tracking control is performed using tracking error signals detected during an OFF period and a rear time

segment within an ON period of a recording pulse signal. The time segment for detecting the tracking error signal within the recording pulse ON period is variably controlled in accordance with recording conditions, such as a disk type and recording speed. Tracking control during recording is conducted such that a tendency towards formation of a pit on an inner circumference side of a track due to heat remaining in an adjacent inner circumference track is canceled and the pit is accurately formed on the center line of the track.

Applicant respectfully submits that support for independent claims 13 and 14 may be found at, for example, page 6, line 5 to page 10, line 9, and page 30, line 14 to page 32, line 16 of the Specification as originally filed.

Independent claim 13, as amended, recites:

forming pits sequentially from an inner circumference to an outer circumference of the optical disk via a light beam irradiated onto a track formed as a groove or land on a recording surface of the optical disk; and

performing tracking control by *offsetting a center of an optical axis of the light beam, by a predetermined amount, from a center line of the track toward the outer circumference of the optical disk*, the predetermined amount being such that *a tendency towards formation of a pit on an inner circumference side of the track due to heat remaining in an adjacent inner circumference track is canceled and the pit is accurately formed on the center line of the track*, wherein a tracking error signal passes through a sample and hold circuit for a recording signal OFF period.

The Takeda reference is directed to an optical recording method such that when

an optical pickup is moved over an optical disk such as a DVD, the optical pickup being positioned onto the target track location, record marks are recorded onto the optical disk by a light beam irradiated onto the optical disk through the optical pickup. An irradiation position of the light beam is offset during recording by a predetermined amount to a track at the recording direction side relative to the target track location, and a record mark is formed on a target track by the offset light beam.

The Takeda reference does not disclose, teach, or suggest the method of independent claim 13, as amended. Unlike independent claim 13, as amended, the Takeda reference does not show performing tracking control in such a way that a *center of an optical axis of the light beam is offset, by a predetermined amount, from a center line of the track toward the outer circumference of the optical disk*, the predetermined amount being such that a *tendency towards formation of a pit on an inner circumference side of the track due to heat remaining in an adjacent inner circumference track is canceled and the pit is accurately formed on the center line of the track*. Although the Takeda reference does disclose recording while track offsetting towards the outer circumference side of the disk, the Takeda reference does *not* teach tracking control such that the optical axis center of a light beam is offset by a predetermined amount by which the *tendency towards formation of a pit on an inner circumference side of the track due to heat remaining in an adjacent inner circumference track is canceled and the pit is accurately formed on the center line of the track*, as recited in independent claim 13, as amended.

independent claim 13!

The Takeda reference discloses that recording is made by track offsetting on the outer circumferential side so as not to influence the already recorded track (land) and,

as to data that is recorded in an offset manner on the adjacent unrecorded land portion on the outer circumferential side due to the offset recording on the outer circumferential side, such data is erased to restore the land portion to an unrecorded state (amorphous state) and then recording is made in this unrecorded portion (col. 4 line 24 to col. 5, line 47). The idea in the Takeda reference is that, because the land portion on the outer circumferential side is originally an unrecorded portion, there is no harm in performing the erasing operation. Thus, in the Takeda reference, the center of the pit formed always is offset towards the outer circumferential side. Therefore, the invention of the Takeda reference is based on the concept of offsetting recording on the outer circumferential side by an amount by which recording is not made on the inner circumferential side. Whereas, in the method of independent claim 13, as amended, tracking control is performed such that the optical axis center of a light beam is offset by a predetermined amount by which the *tendency towards formation of a pit on an inner circumference side of the track due to heat remaining in an adjacent inner circumference track is canceled* and the pit is accurately formed on the center line of the track, which is not mentioned at all in the Takeda reference.

The Watanabe reference does not make up for the deficiencies of the Takeda reference. The Watanabe reference is directed to an optical disk apparatus that optically records signals in a recording medium and reproduces the recorded signals using a laser beam emitted from a light source, such as a laser. More specifically, the Watanabe reference relates to an optical disk apparatus equipped with a focus control system for controlling focusing of the light beam irradiating the recording medium so that the light beam is focused on a prescribed position of the recording medium.

The Watanabe reference does not disclose, teach, or suggest the method of independent claim 13, as amended. Unlike independent claim 13, as amended, the Watanabe reference does not make mention at all of performing tracking control by offsetting *a center of an optical axis of the light beam, by a predetermined amount, from a center line of the track toward the outer circumference of the optical disk*, the predetermined amount being such that *a tendency towards formation of a pit on an inner circumference side of the track due to heat remaining in an adjacent inner circumference track is canceled and the pit is accurately formed on the center line of the track*. The Watanabe reference only shows how to detect and calculate tracking offset by detecting a maximum value and a minimum value of a tracking error signal, and calculating the tracking offset from the difference between these values or from an integrated value of sample TE signals; and a compensation amount is calculated from this tracking offset amount (col. 41, line 55 to col. 42, line 25; and Fig. 25(a)). There is no disclosure at all in the Watanabe reference of tracking control such that the optical axis center of a light beam is offset by a predetermined amount by which the *tendency towards formation of a pit on an inner circumference side of the track due to heat remaining in an adjacent inner circumference track is canceled and the pit is accurately formed on the center line of the track*, as recited in independent claim 13, as amended. Accordingly, applicant respectfully submits that independent claim 13, as amended, distinguishes over the above-cited references.

New independent claim 14 recites limitations similar to independent claim 13, as amended. Accordingly, applicant respectfully submits that new independent claim 14 distinguishes over the above-cited references for the reasons set forth above with

respect to independent claim 13, as amended.

Please replace the drawing figures with the formal drawing figures enclosed herewith.

Applicant believes that the foregoing amendments place the application in condition for allowance, and a favorable action is respectfully requested. If for any reason the Examiner finds the application other than in condition for allowance, the Examiner is requested to call either one of the undersigned attorneys at the Los Angeles telephone number (213) 488-7100 to discuss the steps necessary for placing the application in condition for allowance should the Examiner believe that such a telephone conference would advance prosecution of the application.

Respectfully submitted,

PILLSBURY WINTHROP LLP

Date: March 5, 2003

By: 

Eric S. Chen
Registration No. 43,542
Attorney For Applicant(s)

Date: March 5, 2003

By: 

Roger R. Wise
Registration No. 31,204
Attorney For Applicant(s)

725 South Figueroa Street, Suite 2800
Los Angeles, CA 90017-5443
Telephone: (213) 488-7100
Facsimile: (213) 629-1033

#19

APPENDIX

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE DRAWINGS:

Please replace the drawing figures with the formal drawing figures enclosed herewith.

IN THE CLAIMS:

Please cancel claims 6-8 without prejudice; amend claim 13; and add new claim 14 as follows:

13. (Amended) An optical disk method for recording information on an optical disk, based on a mark-length recording scheme, [by forming pits sequentially from an inner circumference to an outer circumference of the optical disk via a light beam irradiated onto a track formed as a groove or land on a recording surface of the optical disk,] comprising:

forming pits sequentially from an inner circumference to an outer circumference of the optical disk via a light beam irradiated onto a track formed as a groove or land on a recording surface of the optical disk; and

performing tracking control [wherein tracking control is performed in such a way that] by offsetting a center of an optical axis of the light beam [is offset], by a predetermined amount, from a center line of the track toward the outer circumference of the optical disk, the predetermined amount being [so] such that a tendency towards formation of a pit on an inner circumference side of the track due to heat remaining in an adjacent inner circumference track is canceled and

the pit is accurately formed on the center line of the track, wherein a tracking error signal passes through a sample and hold circuit for a recording signal OFF period.

Please add new independent claim 14 as follows:

14. (New) An optical disk recording device for recording information on an optical disk, based on a mark-length recording scheme, by forming pits sequentially from an inner circumference to an outer circumference of the optical disk via a light beam irradiated onto a track formed as a groove or land on a recording surface of the optical disk, said optical disk recording device comprising:

a tracking signal generating section that sequentially outputs a tracking error signal during a particular period from a given time point within a recording signal ON period after formation of a pit is initiated in response to turning on a recording pulse signal and a reflection of the light beam from the optical disk passes a peak level to a subsequent time point when the recording pulse signal is next turned on, and that, during a period other than said particular period, holds a level of the tracking error signal detected immediately before said period, passes the tracking error signal through a sample and hold circuit for a recording signal OFF period, or outputs a zero-level tracking error signal, said tracking signal generating section smoothing the tracking error signal to thereby provide the smoothed tracking error signal as a tracking signal;

an offset imparting circuit to impart an offset to the tracking signal to offset a center of an optical axis of the light beam by a predetermined amount from a

center line of the track toward the outer circumference of the optical disk;

a storage circuit to store information indicative of optimum offset values corresponding to various possible recording conditions;

a control circuit to read out one of the optimum values corresponding to current conditions and sets the offset, to be imparted by said offset imparting circuit, to the read-out offset value, and performs tracking control using the tracking signal having the offset imparted thereto, wherein the read-out offset value is set so that a tendency towards formation of a pit on an inner circumference side of the track due to heat remaining in an adjacent inner circumference track is canceled and the pit is accurately formed on the center line of the track.